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PCT/GB98/02671

PATENT COOPERATION TREATY

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From the INTERNATIONAL BUREAU

To:

DANIELS, Jeffrey, Nicholas  
Page White & Farrer  
54 Doughty Street  
London WC1N 2LS  
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TECHNOLOGY CENTER

NOTIFICATION OF THE RECORDING  
OF A CHANGE

(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

Date of mailing (day/month/year) 16 February 2000 (16.02.00)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference 87572/CMH	
International Application No. PCT/GB98/02671	International filing date (day/month/year) 04 September 1998 (04.09.98)

1. The following indications appeared on record concerning:

☒ the applicant ☐ the inventor ☐ the agent ☐ the common representative

Name and Address CAMBRIDGE DISPLAY TECHNOLOGY LIMITED 181A Huntingdon Road Cambridge CB3 0DJ United Kingdom	State of Nationality GB	State of Residence GB
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person ☐ the name ☒ the address ☐ the nationality ☐ the residence

Name and Address CAMBRIDGE DISPLAY TECHNOLOGY LIMITED Greenwich House Madingley Rise Madingley Road Cambridge CB3 0HJ United Kingdom	State of Nationality GB	State of Residence GB
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

☒ the receiving Office ☐ the designated Offices concerned  
☐ the International Searching Authority ☒ the elected Offices concerned  
☐ the International Preliminary Examining Authority ☐ other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Margret Fourné-Godbersen Telephone No.: (41-22) 338.83.38
---	--

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

United States Patent and Trademark  
Office  
(Box PCT)  
Crystal Plaza 2  
Washington, DC 20231  
ÉTATS-UNIS D'AMÉRIQUE

In its capacity as elected Office

Date of mailing (day/month/year)

08 June 1999 (08.06.99)

International application No.

PCT/GB98/02671

Applicant's or agent's file reference

87572/CMH

International filing date (day/month/year)

04 September 1998 (04.09.98)

Priority date (day/month/year)

05 September 1997 (05.09.97)

Applicant

PICHLER, Karl et al

1. The designated Office is hereby notified of its election made:



in the demand filed with the International Preliminary Examining Authority on:

31 March 1999 (31.03.99)



in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Lazar Joseph Panakal

Telephone No.: (41-22) 338.83.38

PCT

REC'D 07 DEC 1999



WIPO

PCT

17

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>87572/JND/CH</b>		<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/GB98/02671</b>	International filing date (day/month/year) <b>04/09/1998</b>	Priority date (day/month/year) <b>05/09/1997</b>	
International Patent Classification (IPC) or national classification and IPC <b>H05B33/22</b>			
Applicant <b>CAMBRIDGE DISPLAY TECHNOLOGY LIMITED et al.</b>			
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>			
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"><li>I <input checked="" type="checkbox"/> Basis of the report</li><li>II <input type="checkbox"/> Priority</li><li>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li><li>IV <input type="checkbox"/> Lack of unity of invention</li><li>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li><li>VI <input type="checkbox"/> Certain documents cited</li><li>VII <input type="checkbox"/> Certain defects in the international application</li><li>VIII <input checked="" type="checkbox"/> Certain observations on the international application</li></ul>			
Date of submission of the demand <b>31/03/1999</b>		Date of completion of this report <b>03.12.99</b>	
Name and mailing address of the international preliminary examining authority:  <b>European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465</b>		Authorized officer <b>Buesing, G</b> Telephone No. +49 89 2399 8356 	

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB98/02671

**I. Basis of the report**

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

**Description, pages:**

1-38 as originally filed

**Claims, No.:**

1-49 as originally filed

**Drawings, sheets:**

1/20-20/20 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB98/02671

### V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

#### 1. Statement

Novelty (N)	Yes: Claims 1 - 49
	No: Claims
Inventive step (IS)	Yes: Claims 1 - 49
	No: Claims
Industrial applicability (IA)	Yes: Claims 1 - 49
	No: Claims

#### 2. Citations and explanations

see separate sheet

### VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

**Section V:**

- 
1. The independent claims 1, 22, 47 and 48 define methods and products, respectively, which combine the formation of polymer layers by self-assembly with the formation of other layers by other methods.

The combination of different layer formation methods results in a reduced production time for the light-emitting device but maintains the advantages inherent to the self-assembled layers.

- 
2. The available prior art documents neither teach or suggest the combination of steps as claimed. The subject-matter of claims 1, 22, 47 and 48, as well as of the claims dependent thereon, is therefore novel and based on an inventive step.
  3. Treatment of a surface prior to the self-assembly step, as claimed in the independent claims 44, 45 and 46, is also not known or obvious from the prior art. Novelty and inventive step is therefore also acknowledged for these claims.

**Section VIII:**

1. The independent claim 44 is vague and indefinite because it merely defines a intended result (such that ...) rather than the process steps necessary to obtain this result.

Independent claim 47 is also vague and indefinite. The product-by-process form is not appropriate in this case because the product can be defined in constructive terms, as has been done in claim 48, for example.

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>87572/CMH</b>	<b>FOR FURTHER ACTION</b> <small>see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.</small>	
International application No. <b>PCT/GB 98/ 02671</b>	International filing date (day/month/year) <b>04/09/1998</b>	(Earliest) Priority Date (day/month/year) <b>05/09/1997</b>
Applicant <b>CAMBRIDGE DISPLAY TECHNOLOGY LIMITED et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. ☐ Certain claims were found unsearchable (see Box I).

2. ☐ Unity of invention is lacking (see Box II).

3. ☐ The international application contains disclosure of a nucleotide and/or amino acid sequence listing and the international search was carried out on the basis of the sequence listing

☐ filed with the international application.

☐ furnished by the applicant separately from the international application,

☐ but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.

☐ Transcribed by this Authority

4. With regard to the title, ☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this International Search Report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is:

Figure No. 1

☐ as suggested by the applicant.

☐ None of the figures.

☒ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB 98/02671

## B III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

Provided is a method of fabricating an organic light-emitting device, which method comprises the steps of :

forming a first electrode (4) for the device over a substrate (2) ;

either forming by self-assembly at least one polymer layer (6,8) over the first electrode (4) and forming other than by self-assembly at least one layer of organic light emissive material (10) over the at least one polymer layer (6,8) ; and forming a second electrode (12) for the device over the at least one layer of organic light emissive material (10) ;

or forming other than by self-assembly at least one layer of organic light emissive material over the first electrode and forming by self-assembly at least one polymer layer over the at least one layer of organic light emissive material ; and forming a second electrode for the device over the at least one polymer layer.

Also provided is an organic light emitting device, obtainable according to the method of the present invention.



## INTERNATIONAL SEARCH REPORT

International Application No.  
PCT/GB 98/02671

## A. CLASSIFICATION OF SUBJECT MATTER

H 05 B 33/22

According to International Patent Classification (IPC) or to both national classification and IPC<sup>6</sup>

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

--H-05-B--

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0701290 A1 (MOTOROLA, INC.) 13 March 1996 (13.03.96), abstract, claims, fig..	1-49
A	US 5247226 A (SATO et al.) 21 September 1993 (21.09.93), abstract, claims, fig..	1-49
A	US 5156918 A (MARKS et al.) 20 October 1992 (20.10.92), abstract, fig..	1-49

☐ Further documents are listed in the continuation of box C.☐ Patent family members are listed in annex.

## \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*G\* document member of the same patent family

Date of the actual completion of the international search

07 December 1998

Date of mailing of the international search report

08. 01. 1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl,  
Fax (+ 31-70) 340-3016

Authorized officer

FELLNER e.h.

## ANHANG

zum Internationalen Recherchen-  
bericht über die internationale  
Patentanmeldung Nr.

## ANNEX

to the International Search  
Report to the International Patent  
Application No.

## ANNEXE

au rapport de recherche inter-  
national relatif à la demande de brevet  
international n°

PCT/GB 9802671 SAE 205387

In diesen Anhang sind die Mitglieder  
der Patentfamilien der in obenge-  
nannten internationalen Recherchenbericht  
angeführten Patentdokumente angegeben.  
Diese Angaben dienen nur zur Unter-  
richtung und erfolgen ohne Gewähr.

This Annex lists the patent family  
members relating to the patent documents  
cited in the above-mentioned inter-  
national search report. The Office is  
in no way liable for these particulars  
which are given merely for the purpose  
of information.

La présente annexe indique les  
membres de la famille de brevets  
relatifs aux documents de brevets cités  
dans le rapport de recherche inter-  
national visé ci-dessus. Les renseigne-  
ments fournis sont donnés à titre indica-  
tif et n'engagent pas la responsabilité  
de l'Office.

In Recherchenbericht angeführtes Patentdokument Patent document cited in search report Document de brevet cité dans le rapport de recherche	Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets	Datum der Veröffentlichung Publication date Date de publication
EP A1 701290	13-03-96	JP A2 8088402 US A 5677545	02-04-96 14-10-97
US A 5247226	21-09-93	DE C0 69207053 EP A1 510541 EP B1 510541 JP A2 4320484	08-02-96 28-10-92 27-12-95 11-11-92
US A 5156918	20-10-92	AU A1 17593/92 WO A1 9217333	02-11-92 15-10-92

## INTERNATIONAL SEARCH REPORT

International Application No.  
PCT/GB 98/02671

## A. CLASSIFICATION OF SUBJECT MATTER

H 05 B 33/22

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Minimum documentation searched (classification system followed by classification symbols)

H 05 B

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Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

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- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*A\* document member of the same patent family

Date of the actual completion of the international search  
07 December 1998

Date of making of the international search report

08.01.1999

Name and mailing address of the ISA

European Patent Office, P.O. 5818 Patentmann 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tlx. 31 631 epo nl,  
Fax (+31-70) 340-2016

Authorized officer

FELLNER e.h.

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## ANHANG

zum internationalen Recherchen-  
bericht über die internationale  
Patentanmeldung Nr.

## ANNEX

to the International Search  
Report to the International Patent  
Application No.

## ANNEXE

au rapport de recherche inter-  
national relatif à la demande de brevet  
international n°

PCT/GB 9802671 SAE 205387

In diesem Anhang sind die Mitglieder  
der Patentfamilien der im obenge-  
nannten internationalen Recherchenbericht  
angeführten Patentdokumente angegeben.  
Diese Angaben dienen nur zur Unter-  
richtung und erfolgen ohne Gewähr.

This Annex lists the patent family  
members relating to the patent documents  
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dans le rapport de recherche inter-  
national visé ci-dessus. Les renseigne-  
ments fournis sont donnés à titre indica-  
tif et n'engagent pas la responsabilité  
de l'Office.

In Recherchenbericht  
angeführtes Patentdokument  
in search report  
Document de brevet cité  
dans le rapport de recherche

Datum der  
Veröffentlichung  
Publication  
date  
Date de  
publication

Mitglied(er) der  
Patentfamilie  
Patent family  
member(s)  
Membre(s) de la  
famille de brevets

Datum der  
Veröffentlichung  
Publication  
date  
Date de  
publication

EP A1 701290

13-03-96

JP A2 8088402  
US A 5677545

02-04-96  
14-10-97

US A 5247226

21-09-93

DE C0 69207053  
EP A1 510541  
EP B1 510541  
JP A2 4320484

08-02-96  
28-10-92  
27-12-92  
11-11-92

US A 5156918

20-10-92

AU A1 17593/92  
WO A1 9217333

02-11-92  
15-10-92